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10/008,849	11/06/2001	Stefan Ufer	5051-550	5088

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EXAMINER	
NOGUEROLA, ALEXANDER STEPHAN	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 06/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/008,849	UFER, STEFAN	
	Examiner	Art Unit	
	ALEX NOGUEROLA	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-46 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 28-45 is/are allowed.

6)☒ Claim(s) 1,3,7-10,16,18,19,21,22 and 24-27 is/are rejected.

7)☒ Claim(s) 2,4-6,11-15,17,20 and 23 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 06 November 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 08012003.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 112

1. Claims 3 and 24-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention:

a) Claim 3 recites the limitation "the plurality of spaced apart fingers" in line 3. There is insufficient antecedent basis for this limitation in the claim;

b) Claim 24 recites the limitation "the patterned upper electrode" in line 9. There is insufficient antecedent basis for this limitation in the claim; and

c) Claim 24 recites the limitation "the portions of the upper electrode" in lines 10-11. There is insufficient antecedent basis for this limitation in the claim.

2. Note that dependent claims will have the deficiencies of base and intervening claims.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 8-10 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Levin et al. (US 4,191,950).

Addressing claim 1, Levin teaches a chemical sensor that senses a chemical (abstract) comprising

a flexible substrate (84);

a flexible lower electrode (73) on the substrate;

a patterned flexible dielectric layer ((77), which is patterned because it has a notch in the upper left corner) on the lower electrode opposite the substrate; and

a patterned flexible upper electrode (75) on the patterned flexible dielectric layer opposite the flexible lower electrode, the patterned dielectric layer and the patterned flexible upper electrode being patterned to establish a current flow path between the flexible lower electrode and he patterned upper electrode through the chemical, if present, upon application of voltage between the flexible lower electrode and the patterned flexible upper electrode (col. 4, ll. 3-27).

Although not needed to meet the claim limitations, Applicant should note that the upper and lower electrodes and the dielectric layer are also patterned since they are made of cloth (patterned fibers).

Addressing claims 8 and 9, the current flow path will extend at least partially along a direction that is orthogonal to the substrate face (col. 5, ll. 3-12).

Addressing claim 10, as seen in Figure 8 the flexible lower electrode is patterned because it has a notch in the upper left corner. It is also patterned because it is made of cloth (patterned fibers).

5. Claims 16, 18, 19, 21, 22, and 24-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Urban et al. (WO 90/12314 A1), hereafter "Urban."

Addressing claim 16, Urban teaches a chemical sensor (abstract and the embodiments of Figures 13-15) that senses a chemical, comprising

a substrate (5);

a lower electrode (2) on the substrate

a patterned dielectric layer (4) on the lower electrode opposite the substrate; and

a patterned upper electrode (3) on the patterned dielectric layer opposite the lower electrode, the patterned dielectric layer and the patterned upper electrode being patterned to establish a first current flow path between the lower electrode and the upper patterned upper

electrode through the chemical, if present, upon application of voltage between the lower electrode and the patterned upper electrode and to establish a second flow path between portions of the patterned upper electrode through the chemical, if present, upon application of voltage between the portions of the patterned upper electrode (implied by Figures 13-15, which show that the lower electrode actually consists of two separate electrode sections and that the upper electrode also consists of two separate electrode sections).

Addressing claims 18 and 19, as may be inferred from Figure 13, since adjacent electrode sections 2 and 3 are above the substrate, the first current flow path will extend at least partially along a direction orthogonal to the substrate face

Addressing claim 21, the lower electrode is patterned in form of substantially circular electrode sections.

Addressing claim 22, the patterned lower electrode is patterned to establish a third current flow as claimed (consider Figures 14 and 15).

Addressing claim 24, Urban teaches a chemical sensor that senses a chemical (abstract and Figures 13-15), comprising

a substrate (5);

a lower electrode (2) on the substrate;

an upper electrode (3) on the lower electrode opposite the substrate and spaced apart form the lower electrode; and

means for establishing a first current path between the lower electrode and the upper electrode through the chemical, if present, upon application of voltage between the lower electrode and the upper electrode (cavity, Figure 13) and for establishing a second current flow path between portions of the patterned upper electrode through the chemical, if present, upon application of voltage between the portions of the upper electrode (opening in cavities, which allows flow between cavities. Note Figures 10 and 12, which show upper electrodes outside the cavity, implying contemplation by Urban of having conductive solution also covering the cavities.)

Addressing claims 25 and 26, Figure 13 shows a substrate face and the lower electrode being on the substrate face. Since the upper electrode is above the lower electrode the first current flow path will extend at least partially along a direction orthogonal to eh substrate face.

Addressing claims 27, the openings in the cavities will also permit a third current flow path as claimed.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Levin et al. (US 4,191,950), hereafter "Levin," in view of DiLorenzo (US 4,760,383), hereafter "DiLorenzo."

Levin teaches a chemical sensor that senses a chemical (abstract) comprising

a flexible substrate (84);

a flexible lower electrode (73) on the substrate;

a patterned flexible dielectric layer (77) on the lower electrode opposite the substrate; and

a patterned flexible upper electrode (75) on the patterned flexible dielectric layer opposite the flexible lower electrode, the patterned dielectric layer and the patterned flexible upper

electrode being patterned to establish a current flow path between the flexible lower electrode and he patterned upper electrode through the chemical, if present, upon application of voltage between the flexible lower electrode and the patterned flexible upper electrode (col. 4, ll. 3-27).

Although not needed to meet the claim limitations, Applicant should note that the upper and lower electrodes are also patterned since they are made of cloth (patterned threads).

Levin does not mention the composition of the flexible lower electrode other than to note that it may be one manufactured by the Herculite Company (col. 4, ll. 37-60). DiLorenzo teaches a moisture-sensing device for bedwetting detection that has electrodes comprising silver impregnated nylon (col. 3, ll. 5-15). It would have been obvious to one with ordinary skill in the art at the time the invention was made to use a conductive cloth comprising a metal as taught by DiLorenzo in the invention of Levin because metals are good or excellent conductors. Although Levin as modified by DiLorenzo does not mention the particular metals listed by Applicant, barring evidence to the contrary, such as unexpected results, since the claimed metals are known electrical conductors and Levin as modified by DiLorenzo does disclose the precious metal silver, the choice of metal, such as gold, platinum, palladium, and/or copper is just a matter of balancing cost, desired conductivity, and inertness.

Allowable Subject Matter

9. Claims 28-45 are allowed.

10. Claims 2, 4-6, 11-15, 17, 20, 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Claim 3 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter:

a) Claim 2: the nonobvious limitation in the combination of limitations is the requirement that "the patterned flexible upper electrode includes a plurality of spaced fingers that are spaced apart from one another by at least an order of magnitude more than the thickness of the patterned flexible dielectric layer."

In Levin the upper flexible electrode has a plurality of perforations (79).

b) Claim 3 appears to properly depend from allowable claim 2, since claim 1 does not require a plurality of spaced apart fingers, but claim 2 does;

c) Claim 4: the nonobvious limitation in the combination of limitations is the requirement that the flexible lower electrode be unpatterned. The flexible lower electrode in Levin is patterned because it has a notch in the upper left corner (Figure 8), which is necessary so that electrical contact can be made with the upper electrode;

c) Claim 5: the nonobvious limitation in the combination of limitations is the requirement that the flexible substrate comprise polyimide. The flexible substrate in Levin is underwear or pajamas (Figure 9 and col. 2, ll. 16-21);

d) Claim 6: the nonobvious limitation in the combination of limitations is the requirement that the flexible dielectric layer comprises polyimide, a Plasma Enhanced Chemical Vapor deposition coating and/or a Diamond-Like Carbon (DLC) coating. The flexible dielectric layer in Levin is made of ordinary cloth (col. 5, ll. 3-10);

e) Claims 11, 12, 14, and 15 depend directly or indirectly from allowable claim 10;

f) Claim 13: the nonobvious limitation in the combination of limitations is the requirement that the patterned flexible upper electrode be patterned to establish a second current flow path between portions of the patterned flexible upper electrode through the chemical, if present, upon application of voltage between the portions of the pattered flexible upper electrode. In Levin the pattern in the flexible upper electrode is an array of perforations for allowing the chemical to migrate freely between the upper and lower

electrodes. Except for the perforations the upper electrode is continuous, so the application of a voltage between portions of the upper electrode would effectively short circuit the chemical sensor;

g) Claim 17: the nonobvious limitation in the combination of limitations is the requirement that the lower electrode be an unpatterned electrode. In Urban the lower electrode is patterned into two separate electrode sections each having a substantially circular shape (Figures 14 and 15);

h) Claim 20: the nonobvious limitation in the combination of limitations is the requirement that the patterned upper electrode includes a plurality of spaced apart fingers. In Urban the patterned upper electrode includes a plurality of spaced apart substantially circular sections. It would not have been obvious to have the electrode sections of the upper electrode in the shape of fingers because the electrode sections each form part of a cavity wall (Figure 13);

i) Claim 23: the nonobvious limitation in the combination of limitations is the requirement that the patterned upper electrode and the patterned lower electrode both include a plurality of spaced apart fingers. In Urban the both the patterned upper electrode and the patterned lower electrode include a plurality of spaced apart substantially circular sections. It would not have been obvious to have the electrode

sections of the upper and lower electrodes in the shape of fingers because the electrode sections of both the upper and lower electrodes each form part of a cavity wall (Figure 13);

h) Claim 28: the nonobvious limitation in the combination of limitations is the requirement of "patterning the flexible dielectric layer using the patterned flexible upper electrode as a mask to establish a current flow path between the flexible lower electrode and the patterned flexible upper electrode through the chemical, if present, upon application of voltage between the flexible lower electrode and the patterned flexible upper electrode."

In Levin the dielectric layer is ordinary cloth (col. 5, ll. 7-10). So the current flow path between the upper and lower electrodes will just be formed by the openings among the weaved fibers of the cloth in the dielectric layer.

In Saban (US 6,110,354) the dielectric layers between the electrode layers do not permit current flow between the electrode layers, as the sensor is especially designed so that "[t]he exposed tips of the electrodes are the active (working) surface of the electrodes" (col. 5, ll. 39-51 and col. 11, ll. 44-49). Also, the substrate is "preferably rigid" (Figures 4A and 4B and col. 8, ll. 56-59).

In the search report for PCT/US02/34485 patent US 4,482,882 A was cited as an "X" reference against claim 28; however, the disclosure of '882 is patentably distinguishable from the invention of claim 28 at least because the substrate in '882 is only disclosed as being glass (col. 3, ll. 3-7).

In the search report for PCT/US02/34485 patent DE 19509518 A was cited as an "X" reference against claim 28; however, the disclosure of '518 is patentably distinguishable from the invention of claim 28 at least because the substrate in '518 is only disclosed as being made of a rigid material, such as glass, alumina, or silicon (page 6, ll. 59-62).

In the search report for PCT/US02/34485 patent JP 07027731 A was cited as an "X" reference against claim 28; however, in the JPO computer translation of this patent the substrate is only disclosed as being made of a rigid material, such as alumina ceramic ([0069] in the "Detailed Description");

i) Claims 29-36 each depend from allowable claim 28;

j) Claim 37: the nonobvious limitation in the combination of limitations is the requirement of "patterning the flexible dielectric layer using the series of patterned flexible upper electrodes as a mask to establish a current flow path between a respective flexible lower electrode and a respective patterned flexible upper electrode through the chemical, if present, upon application of voltage between the flexible lower electrode and the patterned flexible upper electrode."

In Saban (US 6,110,354) the dielectric layers between the electrode layers do not permit current flow between the electrode layers, as the sensor is especially designed so that "[t]he exposed tips of the electrodes are the active (working) surface of the

electrodes" (col. 5, ll. 39-51 and col. 11, ll. 44-49). Also, the substrate is "preferably rigid" (Figures 4A and 4B and col. 8, ll. 56-59);

In the search report for PCT/US02/34485 patent US 4,482,882 A was cited as an "X" reference against claim 28; however, the disclosure of '882 is patentably distinguishable from the invention of claim 28 at least because the substrate in '882 is only disclosed as being glass (col. 3, ll. 3-7).

In the search report for PCT/US02/34485 patent DE 19509518 A was cited as an "X" reference against claim 28; however, the disclosure of '518 is patentably distinguishable from the invention of claim 28 at least because the substrate in '518 is only disclosed as being made of a rigid material, such as glass, alumina, or silicon (page 6, ll. 59-62).

In the search report for PCT/US02/34485 patent JP 07027731 A was cited as an "X" reference against claim 28; however, in the JPO computer translation of this patent the substrate is only disclosed as being made of a rigid material, such as alumina ceramic ([0069] in the "Detailed Description");

k) Claims 38-44 each depend from allowable claim 37;

l) Claim 45: the nonobvious limitation in the combination of limitations is the requirement of applying voltage between adjacent portions of the patterned upper electrode and between adjacent portions of the patterned lower electrode.

Although not stated in the abstract of Urban, one with ordinary skill in the art would understand the upper electrode to be a working electrode or a counter electrode and the lower electrode to be the complementary counter electrode or working electrode with respect to the upper electrode, since the inner electrode (1) is a reference electrode. It would not have been obvious to apply voltage between adjacent portions of the patterned upper electrode and between adjacent portions of the patterned lower electrode because the adjacent portions of the upper electrode and the adjacent portions of the lower electrodes are working or counter electrodes located in different cavities intended to be separate electrochemical measurement cells.

In the search report for PCT/US02/34485 patent US 4,482,882 A was cited as an "X" reference against claim 45; however, '882 does not disclose applying voltage between adjacent portions of the patterned upper electrode and between adjacent portions of the patterned lower electrode. It would not have been obvious to do so because the upper electrode is electrically continuous and the lower electrode is electrically continuous (Figures 3d and 3e). So, applying voltage between adjacent portions of the patterned upper electrode and between adjacent portions of the patterned lower electrode would just result in short circuits.

In the search report for PCT/US02/34485 patent DE 19509518 A was cited as an "X" reference against claim 45; however, Figure 2 shows upper electrode being electrically continuous and the lower electrode being electrically continuous. So, applying voltage between adjacent portions of the patterned upper electrode and between adjacent portions of the patterned lower electrode would just result in short circuits.

In the search report for PCT/US02/34485 patent JP 07027731 A was cited as an "X" reference against claim 45; however, in the JPO computer translation of this patent there is no mention of applying voltage between adjacent portions of the patterned upper electrode and between adjacent portions of the patterned lower electrode. Also, '731 teaches away from applying voltages in such a manner because independent signals are recorded from the upper and lower electrodes ([0075] and [0079] of the "Example").

In the search report for PCT/US02/34485 patent US 4,191,950 was cited as an "X" reference against claim 45; however, no mention of applying voltage between adjacent portions of the patterned upper electrode and between adjacent portions of the patterned lower electrode. In US 4,191,950 the pattern in the flexible upper electrode is an array of perforations for allowing the chemical to migrate freely between the upper and lower electrodes. Except for the perforations the upper electrode is continuous, so the application of a voltage between portions of the upper electrode would effectively short circuit the chemical sensor; and

m) Claim 46 depends from allowable claim 45.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (571) 272-1343. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alex Noguerola
Primary Examiner
AU 1753
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